



# Natural Gas STAR Recommended Technologies and Practices—Gathering and Processing Sector

**N**atural Gas STAR is a voluntary partnership program between the U.S. Environmental Protection Agency (EPA) and the oil and natural gas industry to cost-effectively reduce methane emissions from oil and natural gas operations both domestically and abroad. Partners implement a variety of voluntary cost-effective technologies and practices to reduce methane emissions each year. By reporting these activities in their Natural Gas STAR annual reports, partners share valuable technical information with EPA and other partners who may benefit from the voluntary implementation of similar technologies and practices.

## Gathering and Processing Accomplishments

Since 1990, gathering and processing sector partners have achieved 34.3 billion cubic feet (Bcf) of methane emissions reductions, or 13.9 million tonnes of carbon dioxide equivalent.

The bar chart below shows the top seven technologies/practices with the largest emissions reductions reported by gathering and processing sector partners since the beginning of the Natural Gas STAR Program. Natural Gas STAR encourages partners to consider additional ways to reduce gas losses, such as these technologies and practices, to ultimately save money and protect the environment.

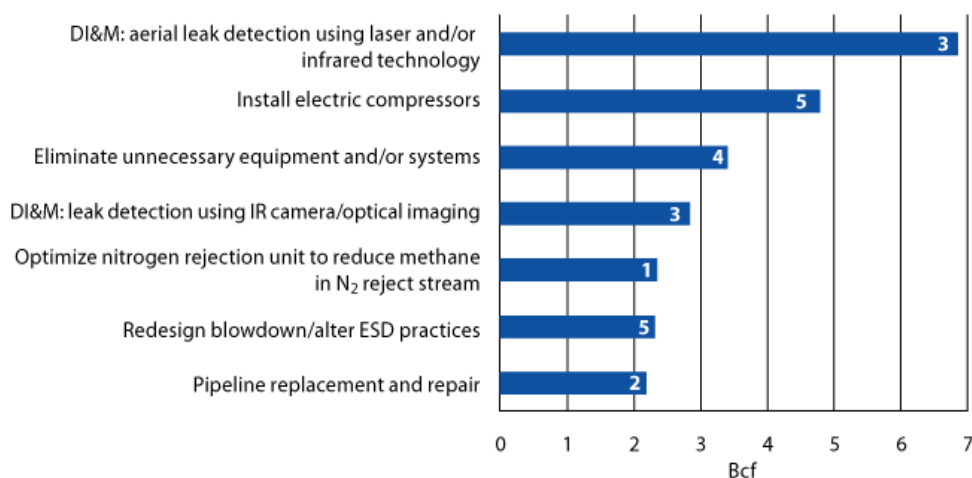
### **Already implementing these technologies and practices?**

Partners performing any of these activities are encouraged to tell EPA about it by including this information in their annual reports.

### **Interested in trying new technologies and practices?**

Detailed descriptions of the technologies/practices presented in the bar chart below can be found on the following page, in addition to information about technical tools and resources available to partners.

## **Technologies/Practices with the Largest Reported Methane Emissions Reductions (Processing Sector)**



The numbers noted on each bar indicate the number of gathering and processing sector partners that have reported these activities since 1990.



## **Technologies/Practices with the Largest Reported Methane Emissions Reductions (Gathering and Processing Sector)**

### **DI&M: Aerial Leak Detection Using Laser and/or Infrared Technology**

With traditional directed inspection and maintenance (DI&M) performed on the ground, inspecting large sections of remote pipeline can be difficult or impossible to inspect, or simply too time consuming. Using laser and/or infrared cameras or other remote detection devices in helicopters or airplanes allows partners to survey large sections of pipeline in a relatively short period of time, allowing them to identify leaks that would otherwise go undetected. **For more information, see “Directed Inspection and Maintenance with Optical Imaging”** at [epa.gov/gasstar/tools/recommended.html#other](http://epa.gov/gasstar/tools/recommended.html#other).

### **Install Electric Compressors**

Gas-fired engines are often used to run compressors, generators, and pumps. In some operations, part of the produced gas stream is used to power these engines. Methane emissions result from leaks in the gas supply line to the engine, incomplete combustion, or during system upsets. Partners reported that installing electric motors in place of gas-fired units can decrease gas losses. Electric motors reduce the chance of methane leakage by eliminating the need for fuel gas, require less maintenance, and improve operational efficiency. **For more information, see “Install Electric Compressors”** at [epa.gov/gasstar/documents/installelectriccompressors.pdf](http://epa.gov/gasstar/documents/installelectriccompressors.pdf).

### **Eliminate Unnecessary Equipment and/or Systems**

Processing facilities are designed to accommodate the maximum expected production rate. As fields mature, production decreases resulting in excess capacity and equipment that result in unnecessary emissions. Consolidating operations and eliminating the operation of unnecessary equipment can effectively reduce natural gas emissions at processing facilities. **For more information, see “Eliminate Unnecessary Equipment and/or Systems”** at [epa.gov/gasstar/documents/eliminateunnecessaryequipmentandorsystems.pdf](http://epa.gov/gasstar/documents/eliminateunnecessaryequipmentandorsystems.pdf).

### **DI&M: Leak Detection Using IR Camera/Optical Imaging**

DI&M is a standard emissions reduction practice for nearly all members of the processing sector. Using infrared (IR) cameras and/or other optical imaging devices to enhance this practice allows partners to pinpoint the source and flow path of escaping gas and differentiate between hydrocarbon residues and actual blowing gas leaks that traditional detection devices can not. **For more information, see “Directed Inspection and Maintenance with Optical Imaging”** at [epa.gov/gasstar/tools/recommended.html#other](http://epa.gov/gasstar/tools/recommended.html#other).

### **Optimize Nitrogen Rejection Unit to Reduce Methane in N<sub>2</sub> Reject Stream**

Cryogenic nitrogen rejection units (NRUs) in gas processing plants are used to remove inert components from the sales gas to meet transmission pipeline standards. The separated nitrogen along with a small percentage of methane is often vented to the atmosphere through a reject stream. The addition of monitoring and tracking equipment can help to optimize process variables, increasing methane recovery and minimizing operating costs. **For more information, see “Nitrogen Rejection Unit Optimization Systems”** at [epa.gov/gasstar/documents/nruoptimization.pdf](http://epa.gov/gasstar/documents/nruoptimization.pdf).

### **Redesign Blowdown/Alter ESD Practices**

When compressors are taken offline or the system shuts down, gas within the compressor and its piping is typically vented to the atmosphere. Emergency shutdown (ESD) systems automatically evacuate hazardous vapors during plant emergencies and shutdowns. Redesigning blowdown and ESD systems to reroute gas back into the system for sale or onsite use can significantly reduce emissions and save money. **For more information, see “Redesign Blowdown Systems and Alter ESD Practices”** at [epa.gov/gasstar/documents/redesignblowdownsystems.pdf](http://epa.gov/gasstar/documents/redesignblowdownsystems.pdf).

### **Pipeline Replacement and Repair**

Gathering pipelines can remain in service for long periods of time and can experience internal corrosion and significant pressure, thermal, and mechanical stresses. Inspecting and repairing or replacing defective or leaky pipe can improve efficiency, save money, and reduce emissions. **For more information, see “Perform Leak Repair During Pipeline Replacement”** at [epa.gov/gasstar/documents/performleakrepairduringpipelinereplacement.pdf](http://epa.gov/gasstar/documents/performleakrepairduringpipelinereplacement.pdf).

## **Technical Tools and Resources**

**Technical Documents** for Natural Gas STAR recommended technologies and practices can be found at [epa.gov/gasstar/tools/recommended.html](http://epa.gov/gasstar/tools/recommended.html).

**Partner Challenge Service** provides assistance to partner companies in identifying and prioritizing new methane emission reduction opportunities. Contact EPA Program Manager, Carey Bylin at (202) 343-9669.

**EPA Program Managers and STAR Service Representatives** are available to assist in reviewing technologies and practices and for all other program-related questions at [epa.gov/gasstar/partners/service-reps.html](http://epa.gov/gasstar/partners/service-reps.html).

**For more information on the Natural Gas STAR Program, visit [epa.gov/gasstar](http://epa.gov/gasstar).**